

Whiplash as a total-body injury

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In our highly active society, individuals and groups push their physical limits. Consequently, the incidence of whiplash injury is increasing. Patients may not recover rapidly or fully from a whiplash injury, thus leading to chronic neck and spinal symptoms and litigation. Physicians must recognize whiplash injury as a manifestation of total-body trauma and treat accordingly, with particular emphasis on alleviating abnormal tension of the fascia. Precise description of the accident, followed by healing methods tailored to well-defined bodily injury, aids in effective management. Whiplash injury poses a challenge to the osteopathic physician to sharpen skills in defining the injury based on the details of the accident and to incorporate myofascial release treatment into traditional modes of whiplash treatment. Fortunately, many highly respected osteopathic physicians have written extensively on the subject and the tools are at hand to refine treatment for both acute and chronic whiplash.

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One of the most difficult injuries the osteopathic physician encounters with ever-increasing frequency is the condition generally referred to as "whiplash." Classically, whiplash, or cervical neck sprain, occurs secondary to a rear-end collision in which the occupants of a vehicle experience unexpected hyperextension followed by hyperflexion overload to the cervical spine.

Occasions for injury

As highways become more congested, vehicular

speed capability increases, and competent drivers interact with noncompetent ones, the incidence of trauma to the neck and spine sharply increases. Similarly, with participants in various sports arenas becoming more physical, whiplash injuries abound. Basketball, for example, once was a minimally physical game. But today, basketball players—like so many participants in other sports—compete so much more aggressively.

Even in the noncompetitive realm, individuals are physically pressing themselves to the point of injury. Runners stumble, mountain climbers slip, bicyclists suddenly jam on brakes, swimmers hit waves, divers attempt shallow or high dives. All are thereby susceptible to injury.

As Magoun¹ illustrates, the traditional birth experience itself whereby a delivery attendant spansks the neonate's delicate body while held upsidedown can result in whiplash injury. Just routine, everyday actions like missing a step or bumping the head into a wall in the dark can cause injury. Amusement park rides can stretch the neck to its limits in all directions, as can speedboating, sailing, and bungee-jumping. So innumerable are the sources of injury throughout life that every person is vulnerable to neck injury at any time.

Obviously, the occasions for injury are many and the osteopathic physician must be prepared to deal with injury from an unlimited number of accident situations. It is essential that the practitioner define both the exact forceful sources of injury as well as design the precise nature and extent of treatment modes necessary to alleviate or eliminate (or both) the discomfort and pain of such injury.

Diagnosis and treatment

Unfortunately, the litigious climate of our society has made diagnosis and treatment, particularly of vehicle-related whiplash injuries, even more difficult. Lawyers specializing in accident cases

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hark their services on public media, and so encourage many people who might ordinarily not do so to cry, "Whiplash" on sustaining a hard jolt whether or not they are seriously injured.

The usual lesion is cervical disc protrusion with progressive pain and aching from dural stretch. When there is neurologic involvement, the patient complains of neck pain, referred to the medial scapular border, with varying degrees of radiation to the arm with possible numbness and upper extremity muscle weakness. However, the same injury may simply stretch the posterior and anterior neck muscles, causing similar pain and radiation.

Conservative treatment modalities are well known to practitioners,² and are outlined in any number of osteopathic medical texts. Harakal,³ for example, discusses the use of cervical spine traction with manipulation. He details the necessity of highly specific evaluation of the patient's injuries and recommends treatment techniques based exactly on that evaluation. He advocates such treatment modalities as (1) osteopathic manipulative treatment (OMT); (2) heat and cold applications; (3) muscle relaxants; and (4) spinal traction as the core of treatment. These measures may then be supplemented with "force and fluid management techniques," treatment of myofascial trigger points with ice massage, acupuncture, ultrasound and vitamin therapy, and the use of various types of neck collars. Heilig⁴ designed a "management of injury approach" focused on treatment methods administered in three stages, namely, the first 5-day period, the following 3-week stage, and then the long-term, ongoing, treatment period. He, too, emphasizes traditional treatment modes, including bed rest, OMT, medication, and physical therapeutic adjuncts, such as ice wraps and ethyl chloride sprays.

Osteopathic physicians know and apply such treatment methods. Nevertheless, despite their meticulous adherence to such traditional applications, there continues to exist a group of patients who manifest symptoms of cervical pain and discomfort well beyond 6 months or even several years. These patients continue to have pain unconfirmed by neurologic evidence or objective x-ray findings. In 1977, Hoppenfeld,⁵ stated, "The practitioner should have confidence, despite the patient pressure, to continue conservative (non-operative) therapy, knowing that the patient may have permanent soft tissue injury, not involving the anterior primary nerve roots or the intervertebral cervical discs." Such an attitude is a difficult one to maintain today.

Further diagnostic exploration becomes essential in this difficult group of patients whose discomfort continues regardless of the intensity and long-term duration of traditional treatment regimens. The practitioner must readily recognize and deal with those few patients who may not authentically want to recover, such as the patient who is comfortable with a legal compensation arrangement. It may be helpful to refer such patients to a suitable other source of assistance or alternative mode of therapy. However, for the majority of patients with long-term whiplash injury, the frustrated practitioner may wish to consider treatment that addresses the whole body that has been victimized by trauma to just one region.

In regard to whiplash incurred in accidents, Carroll and associates⁶ caution against two dangers. One, it should not be assumed that litigation is a great motivating factor in patients having whiplash. Their research indicates that only 5% of such injuries remain chronic, whereas healing occurs in the other 95% within 1 year. They also found that healing occurs at a specified pace regardless of any pending legal actions. Second, they caution practitioners against playing an iatrogenic role in such treatments. Whiplash, as these researchers indicate, may predispose to degenerative arthritis. Nevertheless, the practitioner should aim to make the patient as free of symptoms and as independent of treatment as soon as possible. How is this goal accomplished?

Total-body approach

The physician must first assume that whiplash is not an injury isolated to one region of the body. Therefore, isolating certain tissues or regions for treatment may be too confining an approach. In addition to nerves, discs, and bones, the osteopathic physician will be dealing with myofascial strains via the fascial continuity of the entire body, including the dura matter—as the connective tissue specialist—surrounding the central nervous system. Fascia tenses under the influence of muscle action. Under abnormal physical conditions common to whiplash injuries, the fascia itself can thicken and shorten, causing painful symptoms.

Superficial fascia, as Becker⁷ indicates, houses Pacinian corpuscles, which can receive deep pressure of forces applied to the body surface. In specific regions, where fascial tension is great due to associated muscular attachments or closely related articulations, skeletal disorders are likely to be the site of a marked, burning type of pain in localized fascia.

Abnormal tension of fascia may have several causes, namely:

- faulty muscle activity;
- alternation in position for relationship of bones;
- change in visceral position; and
- sudden or gradual altered vertebral mechanics.

Some of the fascial specializations function in posture and, as such, are among the first to show changes in the presence of postural defects; these fascia include:

- lumbodorsal fascia;
- iliotibial band of the fascia lata;
- gluteal fascia; and
- cervical fascia.

Because the origin of many muscles is generated from within the deep surface of fascia and each muscle is invested by fascial sheaths, both fascia and muscle are often treated together in myofascial release techniques.⁸ Such techniques relate directly to what Greenman⁹ views as a major principle of therapy, namely, "that of assuring adequate arterial blood flow to the cellular milieu in the region of the head and neck and adequate return circulation through the venous and lymphatic systems." Application of myofascial treatment to the spine, as a whole, assures further that the body benefits throughout from increased improvement of the circulatory system. Such total-body treatment may affect and improve the condition of the chronically troubled whiplash patient, as injury sustained in accidents extends beyond the neck region itself.

The sooner the initiation of fascial treatment—that is, before chronic changes occur—the better. The body has "memory of injury," making injuries tend to become additive.

Description of accident situation

It is essential to visualize the total-body effect from any type of whiplash injury, regardless of its external source. Becker¹⁰ discusses the concept of the "arc of force." He describes this concept as a unidirectional arc of force that affects the victim's entire being. He advises that, "To begin at the patient's body is to adopt a too-near approach to the problem." Therefore, the practitioner must try, with the aid of the patient's recall, to reconstruct the specific details of the accident situation. It is essential to determine precisely what internal and external regions of the body sustained impact, the directions from which the impact was received, and what level body surfaces were injured. Constructing as exact a descrip-

tion of the accident as possible is vital to such a determination.

Following is a brief description of an accident situation containing possible points of tissue trauma:

- The accident victim suddenly experiences terror and surprise, accompanied by a huge gasp of air with the diaphragm, the largest muscle of the body, reacting to the event; this reaction is termed *shock*.
- The accident victim locks hands and elbow tightly onto the steering wheel.
- The victim slams on the brake with the right foot while possibly tending to jam the clutch or floorboard with the left foot.
- If worn, the seatbelt locks tightly over the victim's pelvis, restricting the left shoulder more than the right one.
- The victim's neck is thrown, or actually whipped, into hyperextension and hyperflexion. Simultaneously, a sudden upward and downward compressive force is exerted on the base of the skull, spine, sacrum, and coccyx bones. The victim's head may actually hit the ceiling of the vehicle, adding to the force of impact on the body as a whole. The vehicle may be thrown off course, adding a sideward twist to the neck, thus complicating the injury.
- Soft tissue changes occur throughout the body, some immediately after impact, and some arising as a result of fluid, swelling, and tissue adjustments during the night and day following the accident.

Comment

The foregoing represents only one common description of the etiology of whiplash injury sustained in a vehicular accident. Many more detailed descriptions of injurious situations exist and must be studied. Such descriptions must be studied and unique ones constructed as the means for designating remedial and corrective treatment processes for each individual.

When undertaking this kind of accident description, it is wise to avoid complex linguistic and nomenclature problems. Becker¹⁰ warns against language becoming a stumbling block when one carries the description to an extreme degree. To attempt to define every possible strata of fascia (for example, Camper's, Cruvielhier, Scarpa, Colles, Buck, et cetera) is to invite diagnostic obfuscation. He advises that definition be simplified with reference to the three main tissue types, namely: superficial, deep, and subserous. It is through relating these tissue regions to the

elements of the accident situation that the osteopathic physician can offer improved treatment plans, with resulting improved prognosis for the patient.

That which creates total-body trauma calls for total-body treatment. Whether a patient sustains a neck injury in recreational, business, or routine everyday pursuits, that individual has been injured—quite literally—from head to foot. Thus, management of such a patient calls for soft tissue treatment directed to more than the head and neck region in addition to application of traditional whiplash treatment plans. Furthermore, such treatment proves most effective when administered as soon as possible after the accident occurs. By incorporating myofascial techniques into initial treatment programs, the osteopathic physician may succeed in reducing or eliminating the chronic suffering and symptoms often persisting for many months or years after a whiplash injury.

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